

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

--	--	--	--	--	--	--	--	--	--

VENUE : _____

SEAT NO : _____

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016/2017

TCP 1101 – PROGRAMMING FUNDAMENTALS

(All sections / Groups)

3 MARCH 2017
3.00 pm - 5.00 pm
(2 Hours)

Question	Marks
1	
2	
3	
4	
Total	

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 16 pages with 4 Questions only.
2. Attempt All Questions. The distribution of the marks for each question is given.
3. Write all your answers in this Question paper.

Question 1

Unless otherwise stated, every code segment provided in every question below is contained within a `main()` function, complete with the directive `#include <iostream>`, `#include <vector>`, and the statements using `namespace std`; and `return 0`;

Write the output as the result of execution of the following code segments. [10 marks]

(a)	<pre>cout<< "\"daily\"";</pre>	
(b)	<pre>int x=1, y=3, z=0; switch(x) { case 0: x = 2; y = 6; z = 1; break; case 1: x = 4; break; default: y = 5; x = 1; } cout << x << y << z << endl;</pre>	
(c)	<pre>int x = 12; do { cout << x << endl; x--; } while (x < 7);</pre>	
(d)	<pre>for(int x=5; x>=1; x--) { for(int y=x; y>=1; y--) { if(x == 2) cout << x << " "; } }</pre>	
(e)	<pre>int a[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 0}; int b, c = 0; for(b = 0; b < 10; ++b) if ((a[b] % 2) == 1) c += a[b]; cout << c << endl;</pre>	
		Continued.....

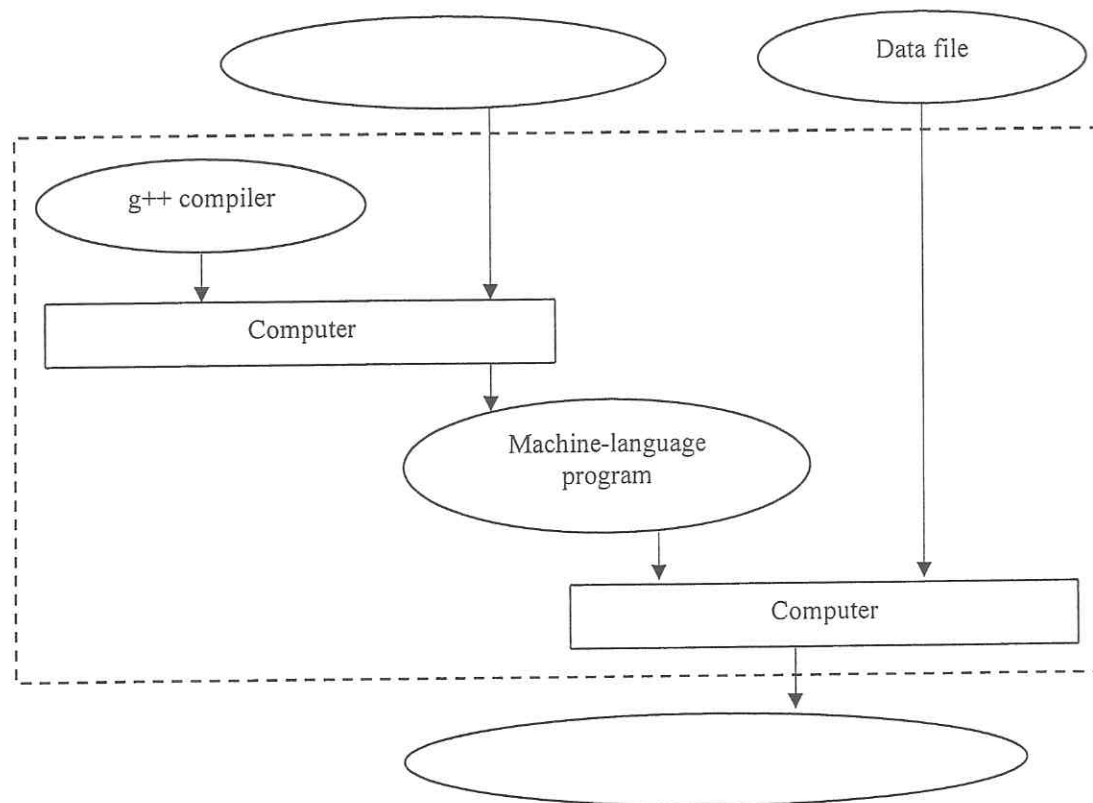
(f)	<pre>#include <iostream> using namespace std; int test(int& a, int b); int main() { int x = 10, y = 2, z; z = test(x, y); cout << z << " " << x << " " << y << endl; } int test(int& a, int b) { if(a > b) { b = 5; a = b; return b; } else { return a; } }</pre>	
(g)	<pre>#include <iostream> using namespace std; void fun(int z[][3]); int main() { int z[2][3] = {1, 2, 3, 4, 5, 6}; fun(z); return 0; } void fun(int x[][3]) { int a, b, c; for(b = 0; b < 3; ++b) { c = 0; for(a = 0; a < 2; ++a) { if(x[a][b] > c) c = x[a][b]; } cout << c << endl; } }</pre>	Continued.....

(h)	<pre>int p = 5, *ptr, *ptr2; ptr = &p; ptr2 = ptr; *ptr = 5*5; cout << p << " " << *ptr2;</pre>	
(i)	<pre>char str[11] = "Fantastic!"; char *a, *b, c=0; b = str; a = str; cout << *(a+5); while (c < 4) { c++; cout << *++b; }</pre>	
(j)	<pre>int *a = new int[10]; for (int i=0; i<10; i++) *(a+i) = i; for (int i=1; i<10; i+=2) cout << a[i] << " "; delete [] a; a = NULL;</pre>	

Continued.....

Question 2

(a) The process of compiling and running a C++ program is shown in figure below. Fill in the TWO missing labels of oval shape. [2 marks]



(b) Translate the mathematical expression " $x < y < z$ " to a C++ expression. [1 mark]

Continued.....

(c) Find the error by stating the line number from the following code segment. Then, fix the error. [2 marks]

```
double x = -12.3; //Line 1
bool isPositive = (x > 0); //Line 2
if (isPositive = true) cout << x << " is positive"; //Line 3
else cout << x << " is not positive"; //Line 4
```

(d) Convert the following pseudocode to a C++ program. [5 marks]

```
Declare integer number
Declare integer largest

Read number
Assign number to largest

While number is not -1
    Read number
    If number > largest
        Assign number to largest
End While

Print largest
```

Sample run 1

```
Enter number: 23
Enter number: 44
Enter number: -1
Largest number: 44
```

Sample run 2

```
Enter number: 2
Enter number: 5
Enter number: 7
Enter number: 1
Enter number: -1
Largest number: 7
```

```
#include <iostream>
using namespace std;
```

```
int main()
{
```

Continued.....

```
// Write your code from here
```

```
// End your code here  
return 0;  
}
```

Continued.....

Question 3

- (a) Given the following character arrays, write the C++ code segment to modify the first array so that it contains its contents to be concatenated with the contents of the second array? i.e., Multimedia University.

[1 mark]

```
char first[25] = "Multimedia ";  
char second[11] = "University";
```

- (b) Complete the following program by writing FOUR function definitions in order to calculate the amount of salary to be paid to the employee. The variable *rate*, *hours* and *amount* are the variables of the function *main*.

- **initialize:** This function initializes *rate*, *hours*, and *amount* to 0.

[1 mark]

- **getHourlyRate:** This function prompts the user to input the hours worked and rate per hour to initialize the variables *hours* and *rate* of the function *main*.

[1 mark]

- **calculate:** This function calculates and returns the amount to be paid to an employee based on the hours worked and rate per hour. The hours worked and rate per hour are stored in the variables *hours* and *rate*, respectively, of the function *main*. The formula for calculating the amount to be paid is as follows: for the first 20 hours, the rate is the given rate; for hours which is over 20, the rate is 1.5 times the given rate.

[1 mark]

- **display:** This function displays the hours worked, rate per hour, and the amount due.

[1 mark]

Sample output 1

```
Enter Hours worked ==> 10  
Enter rate per hour ==> 1  
The hours worked is 10  
The rate per hour is 1  
The amount to be paid is 10
```

Sample output 2

```
Enter Hours worked ==> 25  
Enter rate per hour ==> 1  
The hours worked is 25  
The rate per hour is 1  
The amount to be paid is 27.5
```

Continued.....

```
#include <iostream>
using namespace std;

// function initialize is to set the parameters to 0
void initialize(float &hr, float &rt, float &amt);

// function getHourlyRate is to prompt user to input
// Hint : see first two lines of Sample output
// 1. hours worked (hr)
// 2. rate per hour (rt)
void getHourlyRate(float &hr, float &rt);

// function to calculate and return amount to be paid to employee
void calculate(float hr, float rt, float &amt);

// function to display the hours worked, rate and amount
// Hint : see last three lines of Sample output
void display(float hr, float rt, float amount) ;

int main()
{
    float rate, hours, amount;

    initialize(hours, rate, amount);
    getHourlyRate(hours, rate);
    calculate(hours, rate, amount);
    display(hours, rate, amount);

    return 0;
}

void initialize(float &hr, float &rt, float &amt)
{
    // write your code here

}
```

Continued.....

```
void getHourlyRate(float &hr, float &rt)
{
```

```
    // write your code here
```

```
}
```

```
void calculate(float hr, float rt, float &amt)
{
```

```
    // write your code here
```

```
}
```

```
void display(float hr, float rt, float amount)
{
```

```
    // write your code here
```

```
}
```

Continued.....

(c) Complete the following C++ program by writing the class *IntegerOperation* so that the program will display the output as shown in the sample output. Class *IntegerOperation* has the followings component:

- two private integer variables *num1* and *num2*. [1 mark]
- default constructor that sets the member variables to 0. [1 mark]
- *input* method to prompt user for the input of the two member variables [1 mark]
- two methods *add* and *subtract* that will add and subtract the two member variables respectively and return the answer for each operation. [2 marks]

The sample output are shown below:

Sample Output 1

```
Enter first number ==> 5
Enter second number ==> 10
Please enter:
1. Add
2. Subtract
Enter your choice ==> 1
Result of addition is 15
```

Sample Output 2

```
Enter first number ==> 10
Enter second number ==> 20
Please enter:
1. Add
2. Subtract
Enter your choice ==> 2
Result of subtraction is -10
```

```
#include <iostream>
using namespace std;

// write your class definition here
// START OF CLASS DEFINITION
```

Continued.....

```
// END OF CLASS DEFINITION
```

```
int main()
{
    int select;
    IntegerOperation x;
    x.input();

    cout << "Please enter: " << endl;
    cout << "1. Add " << endl;
    cout << "2. Subtract " << endl;
    cout << "Enter your choice ==> ";
    cin >> select;

    if(select == 1)
        cout << "Result of addition is " << x.add() << endl;
    if(select == 2)
        cout << "Result of subtraction is " << x.subtract()
            << endl;

    return 0;
}
```

Continued.....

Question 4

(a) Write a program to store a user's particulars into an external text file. The program should perform the following tasks:

- Asks for the user to enter his/her name (*string* type), weight (*double* type) and height (*int* type).
- Open a file named 'personal.txt' to store the particulars, based on the comma-separated format shown below. Test for failure to open the file, and print a message if failure occurs.

Data format for 'personal.txt'

Mickey Mouse,40.5,161

[4 marks]

```
#include <iostream>
```

```
#include <fstream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    // Write your code from here
```

Continued.....

```
// End your code here  
return 0;  
}
```

Continued.....

- (b) With the following variable initializations, write C++ statement(s) using only the pointer variable **ptr** to perform the following tasks below:

```
#include <iostream>
using namespace std;
int main()
{
    int a[6] = {2,4,6,8,10,12};
    int *ptr = a;

    return 0;
}
```

[4 marks]

- (i) Display the fourth integer in the array.
Expected output: 8

- (ii) Use a loop to display all integers in the array.
Expected output: 2 4 6 8 10 12

- (iii) Create another integer pointer variable **ptr2** to point to the end of the array (last integer in the array).
No expected output.

Continued.....

- (c) The following program contains an error in how the pointers are handled. Identify and describe the error. Then, provide a correction to resolve the error.

[2 marks]

```
#include <iostream>
using namespace std;

int main()
{
    int *ptr = new int;
    int *ptr2 = ptr;

    delete ptr;
    ptr = NULL;

    return 0;
}
```

End of Page